CITY OF BAINBRIDGE ISLAND
DEPARTMENT OF PUBLIC WORKS

ERICKSEN AVENUE CIRCULATION STUDY

TECHNICAL MEMORANDUM

September 2001

JDL
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TMODEL CORPORATION

INTRODUCTION

The objective of this study was to investigate the impact to vehicle and pedestrian circulation if a formal connection of Ericksen Avenue to Hildebrand Lane was made. Currently, the north end of Ericksen Avenue forms a dead-end at a small park facility at the intersection of Ericksen Avenue and Wallace Way. Vehicles use the driveway at the Frontier Bank parking lot as an informal connection to drive between Ericksen Avenue and Hildebrand Lane. Past efforts to control traffic volumes and turning movements included the installation of c-curb at the bank driveway and on Wallace Way, and speed bumps along the driveway. Despite these efforts, a significant volume of traffic continues to use this informal connection.

Ericksen Avenue is an important north-south connection used by bicyclists and pedestrians as the most direct connection between Winslow Way and High School Road. It has been identified as a historical roadway with some of the community's first homes. Limited north-south connections between Winslow Way and High School Road, along with development pressures throughout the Winslow area have increasingly resulted in higher vehicle traffic volumes on Ericksen Avenue, particularly between Winslow Way and Wyatt Avenue.

The 1994 Winslow Master Plan identified Ericksen as an important internal connection for pedestrians and bicyclists, and called for sidewalk and bicycle lane improvements. As part of the final plan, the decision on whether to connect Ericksen Avenue to Hildebrand Lane was put off until a full analysis of impact of the connection could be ascertained. This study addresses the Winslow Master Plan requirements.

METHODOLOGY

The study is focused on the vehicle traffic, pedestrian, and bicycle movements related to the Ericksen Avenue corridor. The analysis included extensive data collection efforts and the use of analysis tools to develop a circulation model of the area. The study area boundaries for this analysis included Grow Avenue, Winslow Way, SR 305 and High School Road.

Data Collection

Data collection was based on traffic counts and general roadway information that describes the transportation network. Information on bicycle and pedestrian movements were also utilized to provide a full understanding of the impacts of the system.

Turning Movement Counts

Existing traffic counts were supplemented by new turning movement counts at key locations. All counts represent the peak hour recorded during the 4:00 to 6:00 p.m. peak period. As a check, approach volumes were compared to City roadway volumes counts conducted during 2000. In many cases, the manual turning movement counts were higher than the City machine counts, making this analysis reflective of a "worst-case" scenario. Table 1 describes the traffic counts used in the analysis, providing the intersection location, date conducted, and source.

Table 1. Source of Traffic Count Data

Location	Date Conducted	Source	Comment
Grow Avenue/High School Road	March 2001	JDL	
Grow Avenue/Wyatt Way	March 2001	JDL	
Madison Avenue/Wyatt Way	March 2001	JDL	
Madison Avenue/High School	May 1999	Heath and Associates	Factored to represent current year
Madison Avenue/Winslow Way	May 1999	Heath and Associates	Factored to represent current year
Driveway/Wallace Way	March 2001	JDL	
Ericksen Avenue/Wyatt Way	March 2001	JDL	
Ericksen Avenue/Winslow Way	May 1999	Heath and Associates	Factored to represent current year
Hildebrand Lane/High School Road	May 1999	Heath and Associates	Factored to represent current year
SR 305/Winslow Way	May 1999	Heath and Associates	Factored to represent current year

Pedestrian and Bicycle Movements

Pedestrian and bicycle directional volumes were recorded by JDL as part of vehicle traffic turning counts locations. Table 2 shows the intersection locations where pedestrian and bicycle volumes recorded during the p.m. peak hour. The number of pedestrian and bicycles counted may be understated because non-motorized traffic levels are likely to be higher outside of evening peak hours and during summer months.

Table 2. Source of Bicycle and Pedestrian Count Data

Location	Date Conducted	Source
Grow Avenue/High School Road	March 2001	JDL
Grow Avenue/Wyatt Way	March 2001	JDL
Madison Avenue/Wyatt Way	March 2001	JDL
Driveway/Wallace Way	March 2001	JDL
Ericksen Avenue/Wyatt Way	March 2001	JDL

System Elements

Other system data was collected and included in this analysis as needed to complete the traffic model and intersection level of service analysis. Data included vehicle speeds, lane configurations, lane widths, roadway lengths, and traffic control devices.

System Analysis

The analysis of the transportation system focused on the operation of the area roadways under four scenarios for automobile traffic and two scenarios for pedestrians and bicycles:

Existing Conditions: 2001 – Represents traffic circulation patterns under existing Ericksen/Hildebrand configuration, assuming the informal connection through bank parking lot. The intersection of High School Road and Madison Avenue was assumed as a roundabout to allow a consistent comparison between all scenarios.

Ericksen Connection: 2001 – Represents traffic circulation patterns with a formal connection between Ericksen/Hildebrand. The analysis assumed the placement of an all-way stop sign at the intersection formed at Wallace Way and Ericksen Avenue.

Future Conditions: Current Network – Represents traffic circulation patterns assuming volumes were increased by 15% throughout the area to reflect future growth without changing the existing roadway network. This assumption provides a closer examination of changes in operation and circulation at higher traffic volumes.

Ericksen Connection: Future – Represents traffic circulation patterns assuming an increase in volumes by 15% and a formal connection between Ericksen/Hildebrand. The analysis assumed placement of an all-way stop sign at the intersection formed at Wallace Way and Ericksen Avenue.

Pedestrian and Bicycle: Existing Configuration – Represents travel patterns and volumes for pedestrians and bicycles under the existing Ericksen Avenue – Hildebrand Lane configuration. Assumes the connection between Ericksen Avenue and Hildebrand Lane through the park pathway.

Pedestrian and Bicycle: Ericksen Connection – Represents the travel patterns and volumes for non-motorized travel with the roadway connection between Ericksen Avenue and Hildebrand Lane. The analysis assumed placement of an all-way stop sign at the intersection formed at Wallace Way and Ericksen Avenue.

Circulation Model

Collected data was entered into a TMODEL2 traffic model. The model uses traffic count information, network data, and general land use data to form a trip table of the area. The model is then calibrated on the existing data set to provide a representation of the current traffic network. The calibrated model is then used to predict changes in traffic volumes as a result of changes in the roadway network. Appendix A provides the summary statistics for the calibrated model.

Intersection Analysis

Data from the model was entered into Synchro 5.0 to estimate traffic operations under existing and future conditions. The Synchro program allows calculation of level of service operation, vehicle queue lengths, and vehicle delay at individual intersections throughout the network. Level of Service operation followed the Highway Capacity Manual 2000 methodology. Appendix B provides a brief discussion of LOS definitions and their application to this study.

Report Findings

This section describes the results and conclusions can be drawn for each of the four scenarios. In addition, potential pedestrian and bicycle issues are identified. The study reviewed traffic operations at 11 intersections, as follows:

- Grow Avenue/High School Road
- Grow Avenue/Wyatt Way
- Madison Avenue/Wyatt Way
- Madison Avenue/High School
- Madison Avenue/Winslow Way
- Driveway/Wallace Way
- Ericksen Avenue/Wyatt Way
- Ericksen Avenue/Winslow Way
- Hildebrand Lane/High School Road
- SR 305/Winslow Way
- Madison Ave/Wallace Way

As requested at the April 3, 2001 public meeting, the intersection of Madison Avenue/Wallace was added to the analysis.

Existing Conditions 2001

Under existing p.m. peak hour conditions, approximately 300 vehicles use the bank parking lot/driveway to connect between Hildebrand/Ericksen. Approximately, 285 trips are found at the intersection of Ericksen Avenue/Wallace Way and 490 trips operate on Hildebrand Avenue, south of High School Road.

Figure 1 shows the LOS operation at each of the study intersections under existing conditions. Currently, the intersections of Madison Avenue/Wyatt Way, Hildebrand Avenue/High School Road, and SR 305/High School Road operate at LOS D. The Comprehensive Plan allows up to a LOS E within the Winslow Core.

Ericksen Connection 2001

The formal connection of Hildebrand Lane to Ericksen Avenue results primarily in a redistribution of traffic from the bank driveway to the new Hildebrand/Ericksen connection. Approximately 370 trips would use the new connection reducing the number of peak hour trips into the bank driveway from 300 to 52. Traffic on Hildebrand south of High School Road would increase by 60 trips (550 total peak hour trips).

Figure 2 shows the level of service operation with the formal connection. As seen in the figure, the LOS would remain unchanged except at the intersection of Hildebrand Avenue/High School Road where the intersection operation would decline to LOS E and Madison Avenue and Wyatt Way where intersection operation would decline from LOS C to LOS D.

Future Conditions: Current Network

This scenario shows the effect on traffic operations if traffic levels increased by 15 percent throughout the Winslow area – without the Ericksen/Hildebrand connection. Approximately 360 vehicles use the bank parking lot/driveway to connect between Hildebrand/Ericksen with 330 trips are found at the intersection of Ericksen Avenue/Wallace Way and 565 trips operate on Hildebrand Avenue, south of High School Road.

As indicated by Figure 3, the level of service operation at Hildebrand Lane/High School Road would decline to LOS F, exceeding the allowable standard for the Winslow Core. Madison Avenue/Wallace Way, Madison Avenue/Wyatt Way, Madison Avenue/Winslow Way, and SR 305/High School Road would decline to LOS E, approaching the maximum standard.

Future Condition: Ericksen Connection

The final scenario demonstrates the effect of a 15 percent increase in Winslow traffic assuming the Ericksen/Hildebrand connection. As under existing conditions, the formal connection of Hildebrand Lane to Ericksen Avenue primarily redistributes traffic from the bank driveway to the new Hildebrand/Ericksen connection. Approximately 440 trips would use the new connection reducing the number of peak hour trips into the bank driveway from 360 to 60. The connection would result in an increase of 70 trips on Hildebrand Lane (635 peak hour trips) south of High School Road.

Figure 4 shows the level of service operation at each of the study intersections. The intersection of Hildebrand Lane/High School Road would decline to LOS F, exceeding the allowable standard for the Winslow Core. Four intersections would go to LOS E, approaching the maximum standard: Madison Avenue/Wallace Way, Madison Avenue/Wyatt Way, Madison Avenue/Winslow Way, and SR 305/High School Road.

Pedestrian and Bicycle: Existing Configuration

Ericksen Avenue currently provides an important link for bicycle and pedestrian traffic. For pedestrians, Ericksen Avenue is the primary travel north-south corridor in the study area with double the volumes on Madison Avenue and ten times the volumes on Grow Avenue. Primary travel routes recorded at Ericksen Avenue/Wyatt Way include northbound on Ericksen Avenue with 25 peak hour pedestrians and westbound on Wyatt Way with 10 p.m. peak hour pedestrians.

Bicycle travel patterns on also focus on Ericksen Avenue during the p.m. peak period. Again Ericksen Avenue has more than double the bicycle volumes than either Grow Avenue or Madison Avenue. More than 40 bicyclists were counted traveling northbound on Ericksen Avenue between Winslow Way and Wyatt Way. Primary travel patterns are northbound on Ericksen Avenue to westbound on Wyatt Way to south Island locations and northbound on Ericksen Avenue to Knetchel Way or Wallace Way to connect up with Madison Avenue south of High School Road.

Figures 5 and 6 indicate the current pedestrian and bicycle travel volumes observed during the p.m. peak hour at selected intersections.

Pedestrian and Bicycle: Ericksen Connection

The formal connection Ericksen Avenue and Hildebrand Lane would eliminate the existing pathway through the "pocket" park in favor of sidewalks, and bicycle lanes along the length of the Ericksen Avenue – Hildebrand Lane corridor.

Pedestrian travel would benefit from improved pedestrian facilities with only minor impact from changes in vehicle volumes. Model results show that for the length of Ericksen Avenue – Hildebrand Lane corridor, peak hour automobile traffic volumes would increase only by 60 vehicles with the connection of the two roadways – or an average of one additional vehicle per minute during the peak hour. Pedestrian-vehicle conflicts along Wallace Way are expected to decrease with vehicle traffic shifted to the Ericksen connection.

The connection of Ericksen Avenue to Hildebrand Lane will disrupt northbound bicycle travel patterns at the intersection of Ericksen Avenue/Wallace Way. Under the current configuration with vehicles traffic using the bank driveway, the intersection of Ericksen Avenue/Wallace Way is a two-legged intersection. For bicyclists traveling north on Ericksen Avenue, they are able to stay on the right-hand side of the road to turn west onto Wallace Way following the curve of the roadway. In addition, at the intersection of Wallace Way and the bank driveway, bicyclist have the right-of-way meaning they are not delayed by the vehicle traffic flows. With the Ericksen Avenue – Hildebrand Lane connection, bicyclist will lose these advantages, requiring them to stop to make a left-hand turn to Wallace Way with the full extent of the peak hour vehicle volume.

Future Study

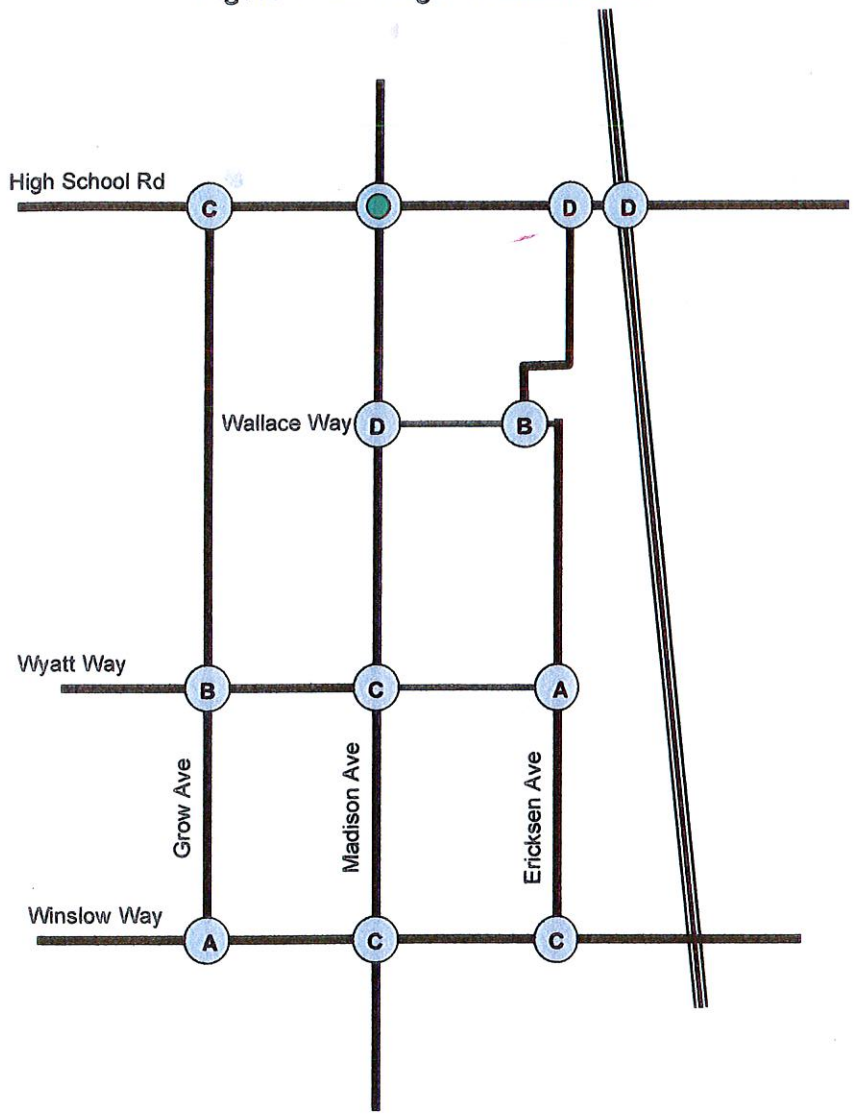
The following areas for additional study of the corridor could provide additional information that would be useful in the Ericksen Avenue – Hildebrand Lane Avenue connection process. All analyses should include the analysis of impacts to pedestrians and bicyclists. Recommendations for further study include:

Impact of closing Frontier Bank driveway on Wallace Way – This study would investigate the impact of disconnecting of Ericksen Avenue and Hildebrand Lane. The expected result is the addition of more than 300 vehicles to other roadways would adversely affect the operation of the network, especially High School Road and Madison Avenue.

Impact to corridor from improvements to intersections at Hildebrand Avenue/High School Road and Ericksen Avenue/Winslow Way – Improvements at these intersections could either increase or decrease the desirability of the Ericksen Avenue – Hildebrand Lane corridor. Expected results will depend on the effect improvements have on intersection capacity at either end of the corridor. For example, limiting traffic to right turns only at Hildebrand Lane/High School Road might reduce corridor traffic, while improvements that increase left turn capacity at the intersection might increase corridor traffic.

Impact of corridor traffic calming – Analysis of proposed traffic calming could be conducted to assess the impact to the corridor, with or without the Ericksen Avenue – Hildebrand Lane connection. Expected results will show that traffic calming will not affect traffic results, but may result in lower traffic speeds along the corridor.

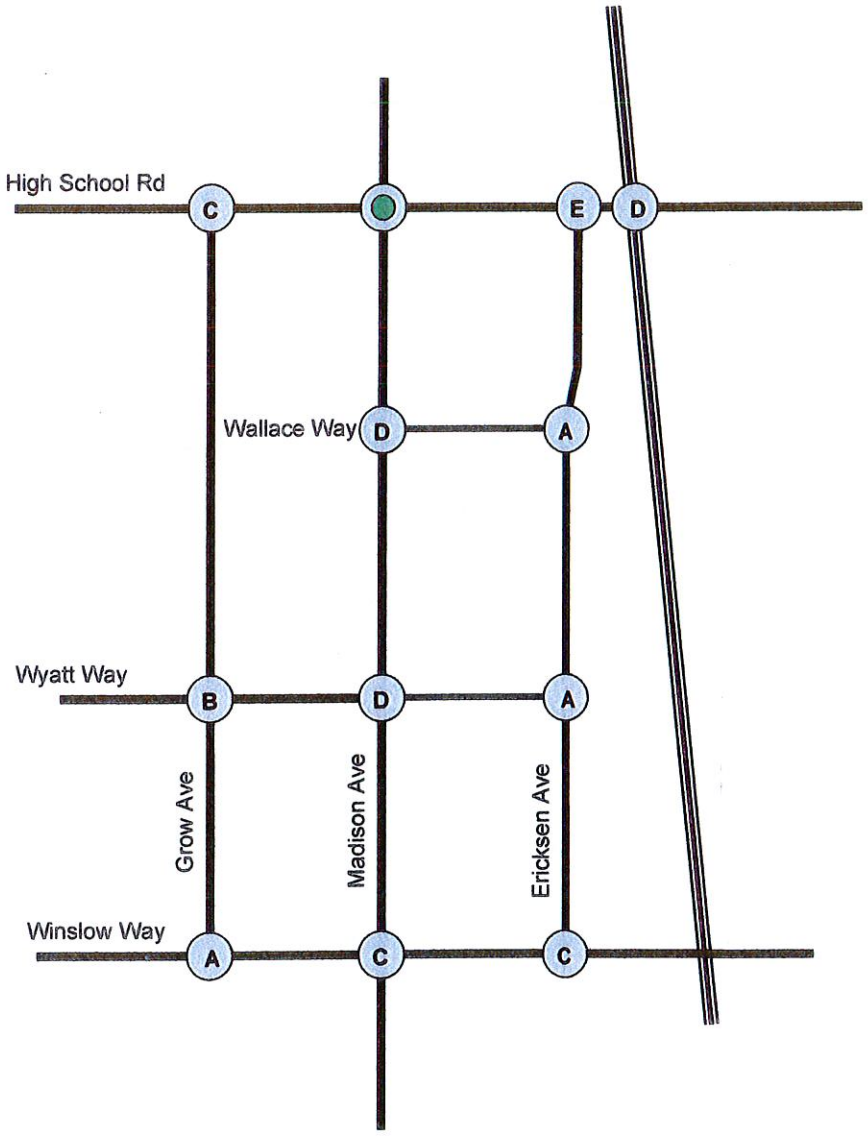
Figure 1: Existing Conditions 2001



Ericksen Avenue Study

JDL

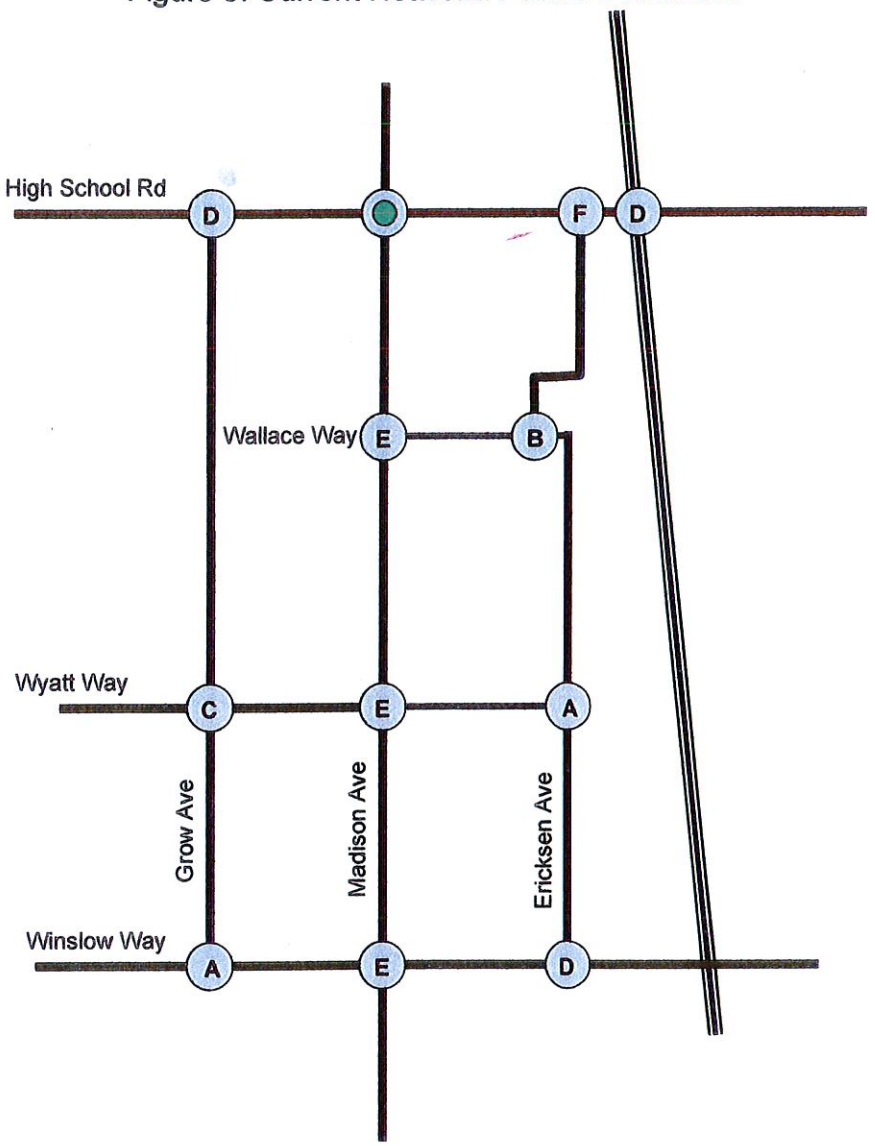
Figure 2: Ericksen Connection 2001



Ericksen Avenue Study

JDL

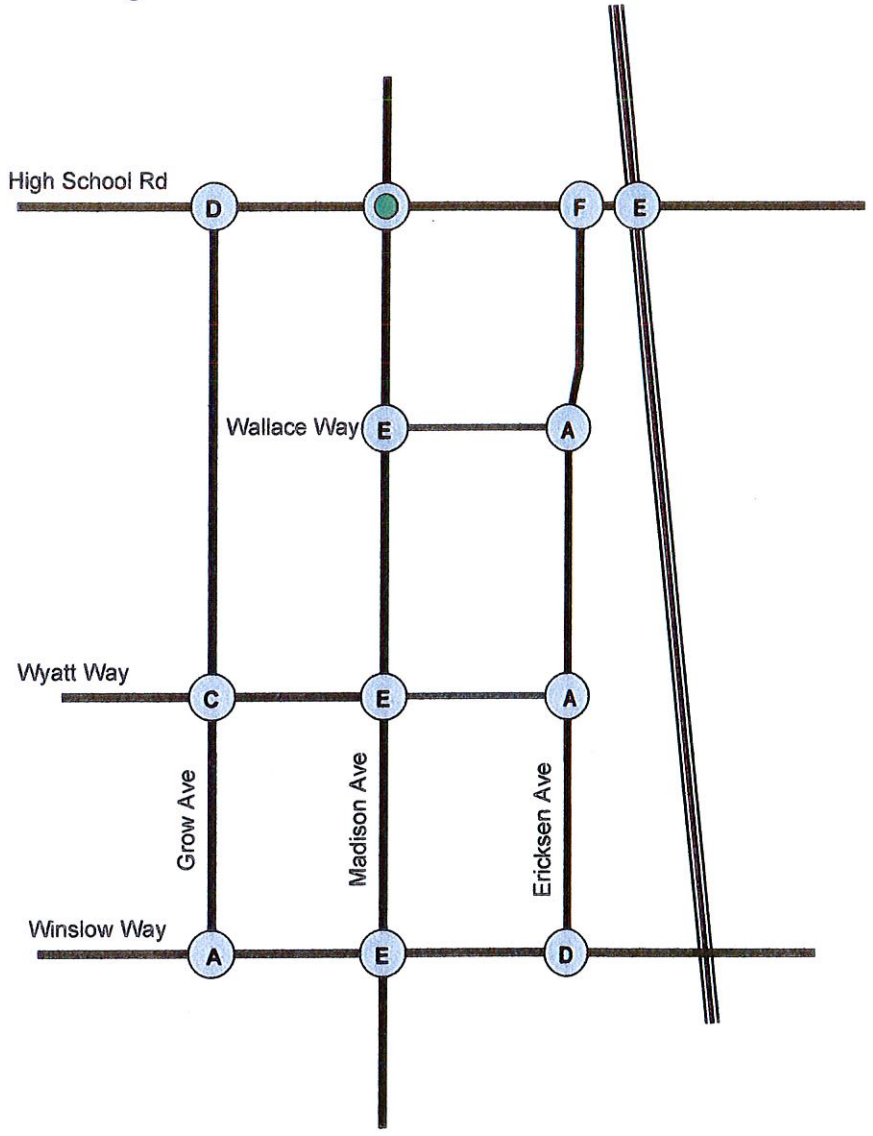
Figure 3: Current Network: Future Conditions



Ericksen Avenue Study

JDL

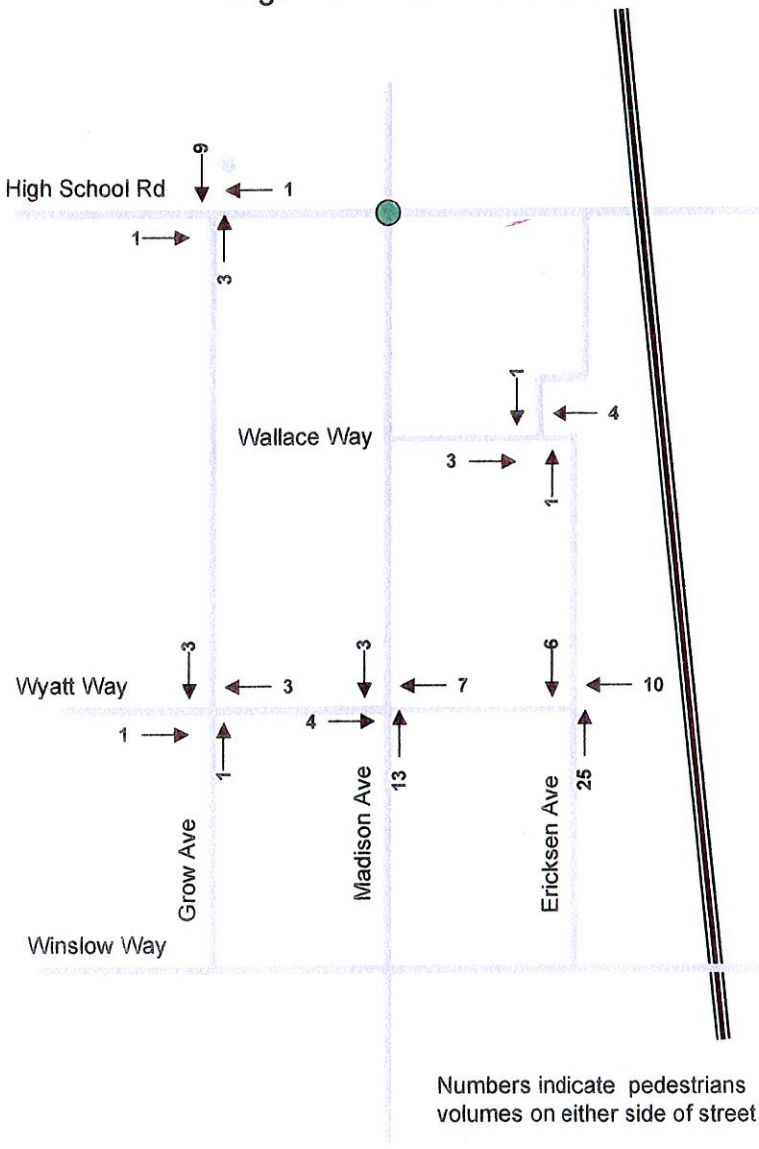
Figure 4: Ericksen Connection: Future Conditions



Ericksen Avenue Study

JDL

Figure 5: Pedestrian Volumes

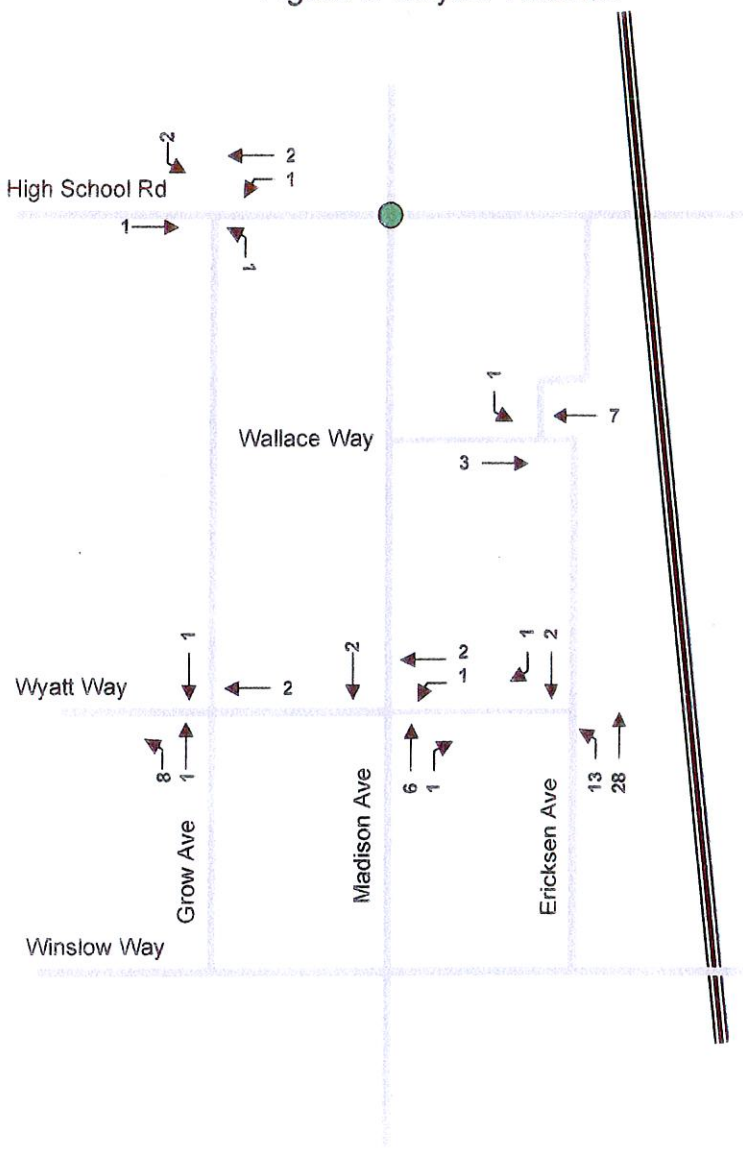


Numbers indicate pedestrians volumes on either side of street

Ericksen Avenue Study

JDL

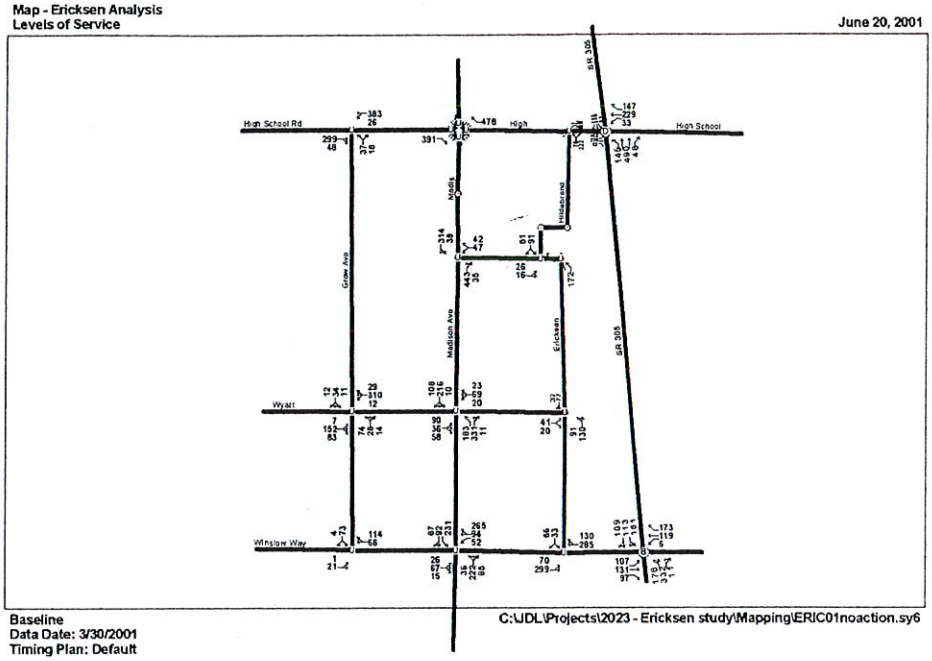
Figure 6: Bicycle Volumes



Appendix A: Synchro Study Network

Map - Ericksen Analysis
Levels of Service

June 20, 2001



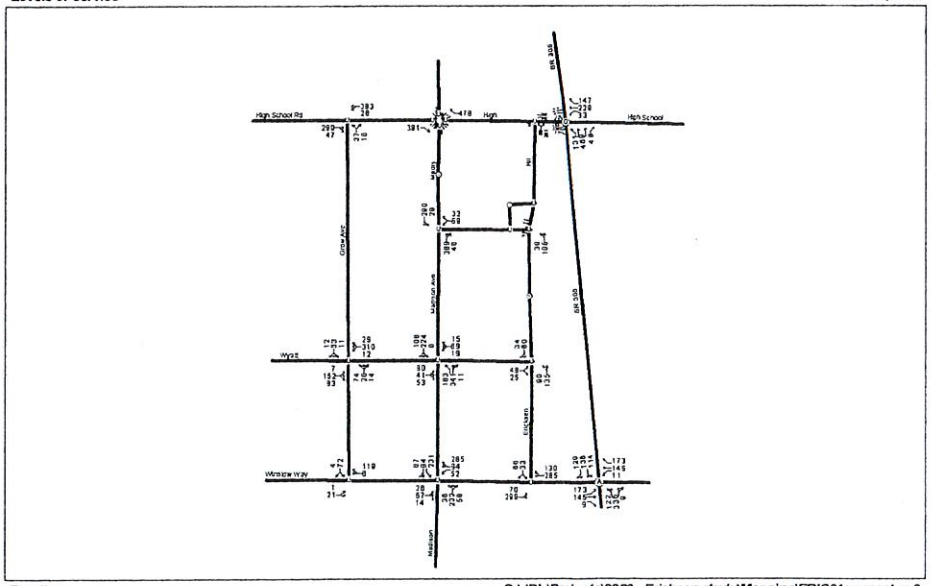
Baseline
Data Date: 3/30/2001
Timing Plan: Default

C:\JDL\Projects\2023 - Ericksen study\Mapping\ERIC01noaction.sy6

2001 – No Connection

Map - Ericksen Analysis
Levels of Service

June 21, 2001



Baseline
Data Date: 3/30/2001
Timing Plan: Default

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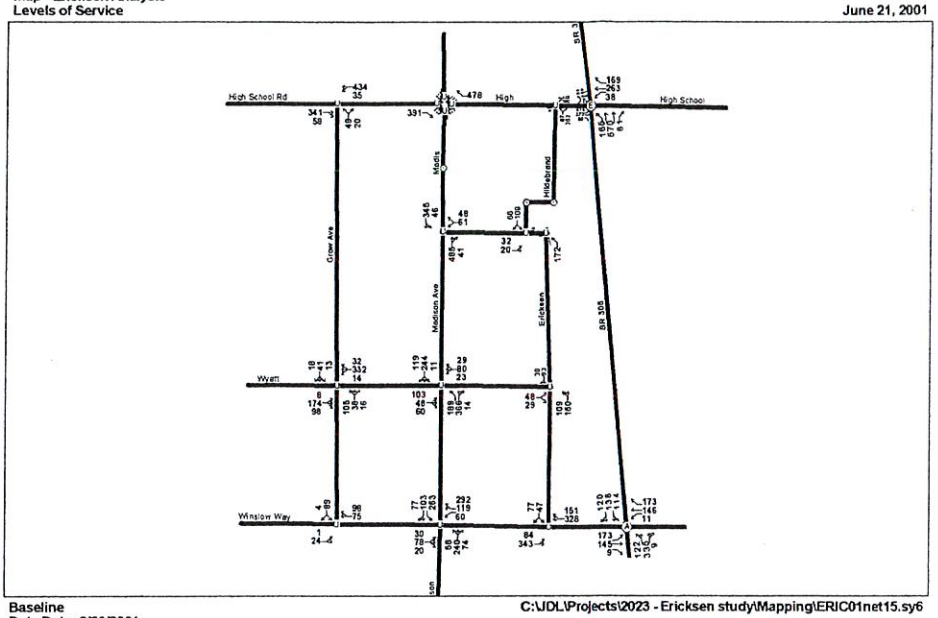
2001 – With Connection

Map - Ericksen Analysis
Levels of Service

June 21, 2001



Baseline
Data Date: 3/30/2001
Timing Plan: Default

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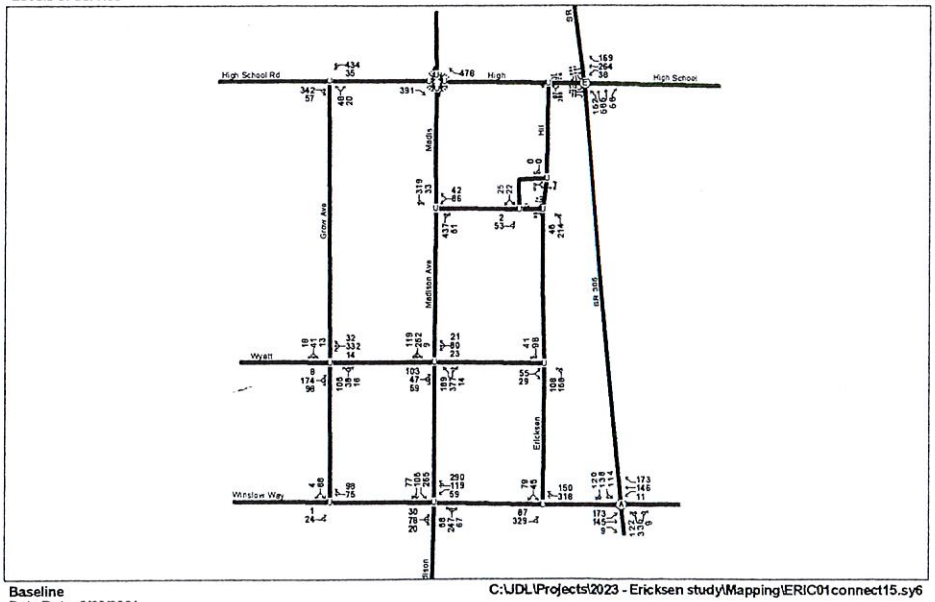
Future – No Connection

Map - Ericksen Analysis
Levels of Service

June 21, 2001



Baseline
Data Date: 3/30/2001
Timing Plan: Default

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Future with Connection

Appendix B: Summary of Level of Service

Intersection		No Action	Existing with Connection	Future Existing Network	Future with Connection
SR 305 / High School Road	Level of Service	D	D	D	E
	Intersection Delay	38.0 seconds	43.8 seconds	51.4 seconds	55.9 seconds
Grow Ave / High School Road	Level of Service	C	C	D	D
	Approach Delay	19.5 seconds	19.5 seconds	27.1 seconds	27.0 seconds
Hildebrand Lane / High School Road	Level of Service	D	E	F	F
	Approach Delay	31.5 seconds	38.3 seconds	68.6 seconds	93.5 seconds
Madison Ave / Wallace Way	Level of Service	D	D	E	E
	Approach Delay	25.7 seconds	25.6 seconds	40.2 seconds	40.4 seconds
Bank Driveway / Wallace Way	Level of Service	B	A	B	A
	Approach Delay	10.8 seconds	9.4 seconds	11.5 seconds	9.7 seconds
Ericksen Avenue / Wallace Way	Level of Service	--	A	--	A
	Approach Delay	--	8.9 seconds	--	10.0 seconds
Grow Avenue / Wyatt Way	Level of Service	B	B	C	E
	Intersection Delay	14.4 seconds	14.4 seconds	19.8 seconds	19.8 seconds
Madison Avenue / Wyatt Way	Level of Service	C	D	E	E
	Intersection Delay	24.5 seconds	25.6 seconds	44.8 seconds	47.1 seconds
Ericksen Avenue / Wyatt Way	Level of Service	A	A	A	A
	Intersection Delay	8.9 seconds	9.0 seconds	9.5 seconds	9.7 seconds
Grow Avenue / Winslow Way W.	Level of Service	A	A	A	A
	Intersection Delay	8.2 seconds	7.6 seconds	8.3 seconds	8.3 seconds
Madison Avenue / Winslow Way	Level of Service	C	C	E	E
	Intersection Delay	23.3 seconds	23.4 seconds	45.6 seconds	46.4 seconds
Ericksen Avenue / Winslow Way	Level of Service	C	C	D	D
	Approach Delay	20.0 seconds	20.0 seconds	32.6 seconds	30.2 seconds